

**IN THE CLAIMS**

1. (currently amended): A semiconductor device comprising:

- a semiconductor substrate;
- an insulating layer disposed on said semiconductor substrate;
- an SOI film disposed on said insulating layer;
- a gate insulator disposed on said SOI film; and
- a gate electrode disposed on said gate insulator;

wherein a source, a drain, and a channel are formed in said SOI film so that said gate insulator is located at least between said channel and said gate electrode, thereby forming a MOSFET including said source, said drain, said channel, said gate electrode, and said gate insulator; and

wherein said gate electrode is made of P-type polysilicon and conductivity types of said source, said drain, and said channel are all N-type, an N-type impurity concentration in said channel is within a range approximately from  $1 \times 10^{17} \text{ cm}^{-3}$  to  $1 \times 10^{18} \text{ cm}^{-3}$ , and a channel length of said channel is within a range approximately from 0.1  $\mu\text{m}$  to 0.25  $\mu\text{m}$ .

2. (canceled)

3. (currently amended): The semiconductor device according to claim [[2,]] 1, wherein said N-type impurity concentration in said channel is approximately  $3 \times 10^{17} \text{ cm}^{-3}$ .

4. (original): The semiconductor device according to claim 1, wherein a thickness of said gate insulator is within a range approximately from 1 nm to 4 nm, and a thickness of said SOI film is within a range approximately from 10 nm to 40 nm.

5. (original): The semiconductor device according to claim 4, wherein said thickness of said gate insulator is approximately 2 nm, and said thickness of said SOI film is approximately 20 nm.

6. (original): The semiconductor device according to claim 1, wherein said source and said drain are doped with N-type impurities so that an N-type impurity concentration in said source and said drain is not less than approximately  $1 \times 10^{21} \text{ cm}^{-3}$ .

7. (canceled)

8. (currently amended): The semiconductor device according to claim [[7,]] 1, wherein said channel length of said channel is approximately 0.15  $\mu\text{m}$ .

9. (currently amended): A metal-oxide-semiconductor field-effect transistor comprising:

a semiconductor substrate having a substrate, an insulating layer which is disposed on the substrate and a silicon layer which is disposed on the insulating layer;

a gate insulator disposed on the silicon layer of the semiconductor substrate;

a gate electrode, which is made of P-type polysilicon, disposed on the semiconductor substrate so that the gate insulator is disposed between the gate electrode and the semiconductor substrate;

a channel region formed in the silicon layer, which is located under the gate electrode;  
and

a source and a drain formed in the silicon layer and being adjacent to the channel region;

wherein conductivity types of the channel region, the source and the drain are all N-type,  
an N-type impurity concentration in the channel region is within a range approximately from

$1 \times 10^{17} \text{ cm}^{-3}$  to  $1 \times 10^{18} \text{ cm}^{-3}$ , and a channel length of the channel region is within a range approximately from 0.1  $\mu\text{m}$  to 0.25  $\mu\text{m}$ .

10. (canceled)

11. (currently amended): The metal-oxide-semiconductor field-effect transistor according to claim [[10,]] 9, wherein the N-type impurity concentration in the channel region is approximately  $3 \times 10^{17} \text{ cm}^{-3}$ .

12. (original): The metal-oxide-semiconductor field-effect transistor according to claim 9, wherein a thickness of the gate insulator is within a range approximately from 1 nm to 4 nm, and a thickness of the silicon layer is within a range approximately from 10 nm to 40 nm.

13. (original): The metal-oxide-semiconductor field-effect transistor according to claim 12, wherein the thickness of the gate insulator is approximately 2 nm, and the thickness of the silicon layer is approximately 20 nm.

14. (original): The metal-oxide-semiconductor field-effect transistor according to claim 9, wherein the source and the drain are doped with N-type impurities so that an N-type impurity concentration in the source and the drain is not less than approximately  $1 \times 10^{21} \text{ cm}^{-3}$ .

15. (canceled)

16. (currently amended): The metal-oxide-semiconductor field-effect transistor according to claim [[15,]] 9, wherein the channel length of the channel region is approximately 0.15  $\mu\text{m}$ .